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Inventory of Bird Species
Eugene O'Neill and John Muir National Historic Sites

2001 Surveys

Submitted to the Point Reyes National Seashore

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Introduction

The purpose of this study was to evaluate breeding bird species composition, distribution and status at the Mt. Wanda property of the John Muir National Historic Site (JOMU) in Martinez, California, and at Eugene O'Neill National Historic Site (EUON) in Danville, California. No systematic standardized surveys of the avian fauna at either park had been conducted prior to the 2001 breeding season surveys.

Point count surveys conducted on the 330-acre Mt. Wanda property (JOMU) were in the following vegetation types: grassland, blue oak woodland, mixed evergreen forest, chaparral, and riparian. Point count surveys conducted at EUON included the following vegetation types: grassland, blue oak woodland, mixed evergreen forest/riparian, and orchard/ruderal/developed. EUON can be characterized as primarily a house site with surrounding ornamental vegetation and an adjacent historic orchard. Most of the remaining native habitat for birds is on the edges of the property contiguous with adjacent East Bay Regional Park lands. Grassland at both JOMU (117 acres) and EUON consists primarily of introduced grass and thistle species. Grazing at JOMU occurred until 1992. Blue oak woodland covers approximately 155 acres of the Mt.

Wanda property and occurs at EUON as well. During the vegetation inventory conducted at JOMU during 2002, a Turkey Vulture nest site was located in chaparral vegetation (Jepson and Murdock 2003). Although Turkey Vultures are common, very few of their nest sites are located. Vegetation types were derived from the Vegetation Inventory Report for the two parks (Jepson and Murdock 2003).

Methods

Point Count Surveys

The point counts were conducted according to protocol outlined in Ralph et al. (1993). Surveys were conducted by a trained field biologist (J. Hammond), who is familiar with the identification of local bird species by sight and sound. Surveys were started at sunrise, as long as weather conditions were favorable (no rain or high winds), and completed within four hours to capture peak bird activity. The points were located 200

meters apart, each point was surveyed for five minutes and all bird detections by sight, song and call were recorded. For all detections, the distance of the bird was also recorded, within a 50-meter radius of the point or beyond. Birds flying over the station during the five-minute count were recorded separately. Any evidence of breeding was also recorded (e.g., material carry, food carry, copulation). GPS coordinates are presented for both sites in Appendix 1.

Mt. Wanda - JOMU. Fourteen point count stations were established along one transect on Mt. Wanda. This transect was located along a dirt road and nature trail and traversed all major habitat types present. These fourteen stations were surveyed three times during the peak songbird breeding season (14 May, 28 May, 11 June).

Eugene O'Neill N. H. S. Three point count stations were conducted within the park boundaries and two point counts were located on adjacent East Bay Regional Park lands. Point count survey stations are generally located a minimum of 200 meters apart and due to the small size and configuration of EUON only 3 survey stations could be placed inside park boundaries. These five stations were surveyed three times during peak songbird breeding season (6 May, 26 May and 9 June).

Area Searches

Area searches were conducted at EUON to collect additional data on bird species occurring at the N.H.S. to supplement the point count survey data. Area searches were conducted at two plots following protocol outlined in Ralph et al. (1993), Slater (1994) and Ambrose (1989). Area search surveys were conducted three times. In summary, each plot – of similar size, and with distinct boundaries – was surveyed for 20 minutes within the first four hours after sunrise by an observer walking and recording all birds identified by sight and/or sound. All individuals detected, type of detection (i.e., visual, song or call), and breeding/flocking behavior were noted.

Data Analysis

Analysis of the point count data provided information on species richness and species diversity. Only species detected within 50 meters of the point were included in the analysis. Species richness is defined as the total number of species detected at the site. Species diversity measures ecological diversity by counting the number of species detected, weighted by the number of individuals of each species. For this analysis, species diversity was measured using a transformation of the usual Shannon-Weiner index. This index, also called the Shannon-Weiner index or the Shannon index, is symbolized by H^1 (Krebs 1989). The transformed index used here is N_1, where $N_1 = 2^H$. The advantage of N_1

over H^1 is that N_1 is measured in terms of species, instead of bits of information. This makes N_1 more easily interpretable, and species diversity (measured as N_1) and richness can be compared.

Results

Species List. Lists of all species encountered during point count surveys are presented in Appendices 2 and 3. The lists include both common and Latin names (shown in italics) for all bird species detected (American Ornithologists' Union 1983).

Point Counts. Forty-one species were detected during point counts at JOMU - Mt. Wanda and 46 species at EUON. A summary of bird species diversity and species richness for each transect is presented in Table 1. The total number of individuals detected within 50 meters of a point along each transect is also shown. For comparison between the two transects, Table 1 also shows the mean number of individuals detected per station per visit. The analyses in Table 1 included all bird species detected both native and introduced species. Hence, these measures are not necessarily good indicators of habitat quality.

TABLE 1. Species diversity, species richness, total number of individuals detected per transect and mean number of individuals detected per station per visit, May – June, 2001.

Transect	No. of Points	Species Diversity (N_1)	Species Richness	Total Indiv. (<50M)	Mean No. of Indiv. Per Station Per Visit (<50M)
JOMU-Mt. Wanda	14	17.8	30	381	9.07
EUON	5	21.03	30	162	10.8

Area Searches. Area searches were only conducted at EUON and only two additional species were detected during area searches that were not detected during point count surveys. These species are included in the species list for EUON in Appendix 3.

Literature Cited

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American Ornithologists' Union. 1983. Check-list of North American birds, 6th edition. American Ornithologists' Union. Washington, D.C.

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Ralph, C.J., G. R. Geupel, P. Pyle, T.E. Martin, and D.F. DeSante. 1993. Handbook of Field Methods for Monitoring Landbirds. USDA Forest Service Publication, PSW-GTR 144. Albany, CA.

Shuford, W. D. 1993. Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds. California Avifauna Series 1. Bushtit Books, Bolinas, CA.

Slater, P.J. 1994. Factors affecting the efficiency of the area search method of censusing birds in open forests and woodlands. Emu 94: 9-16.

Appendix 3 – GPS Coordinates

EUON

Datum,North America 1983,GRS 80,0,-1.6E-7,0,0,0
WP, UTM,1, 10S ,585720.0,4186940.0,05/06/2001,12:00:00,1
WP, UTM,4, 10S ,585601.0,4186787.0,05/14/2001,12:00:00,4
WP, UTM,5, 10S ,585406.0,4186810.0,05/14/2001,12:00:00,5
WP, UTM,2, 10S ,585311.0,4187056.0,05/14/2001,12:00:00,2
WP, UTM,3, 10S ,585531.0,4187029.0,05/14/2001,12:00:00,3

JOMU

Datum,North America 1983,GRS 80,0,-1.6E-7,0,0,0
WP, UTM,2, 10S ,576187.0,4203643.0,05/14/2001,12:00:00,2
WP, UTM,5, 10S ,575775.0,4203972.0,05/14/2001,12:00:00,5
WP, UTM,6, 10S ,575722.0,4204170.0,05/14/2001,12:00:00,6
WP, UTM,7, 10S ,575733.0,4204393.0,05/14/2001,12:00:00,7
WP, UTM,8, 10S ,575912.0,4204477.0,05/14/2001,12:00:00,8
WP, UTM,9, 10S ,576146.0,4204516.0,05/14/2001,12:00:00,9
WP, UTM,10, 10S ,576290.0,4204643.0,05/14/2001,12:00:00,10
WP, UTM,11, 10S ,576347.0,4204457.0,05/14/2001,12:00:00,11
WP, UTM,12, 10S ,576146.0,4204394.0,05/14/2001,12:00:00,12
WP, UTM,13, 10S ,576280.0,4204252.0,05/14/2001,12:00:00,13
WP, UTM,14, 10S ,576470.0,4204195.0,05/14/2001,12:00:00,14

Appendix 2 – JOMU, Mt. Wanda

The following bird list includes all birds seen or heard on Mt. Wanda during point count surveys and other visits during the breeding season of 2001 (primarily May and June). This is not a comprehensive list of bird species that may be seen at Mt. Wanda since we did not survey during migration or during the winter. All species detected from standardized data collection and casual observations are included in the list. Common name (from the 1983 A.O.U. Checklist), breeding status and nest type are listed for all birds encountered.

Breeding status was determined for all species encountered by using information collected during the point count surveys. We used the following four categories as derived from breeding bird atlas criteria (Shuford 1993).

0) No evidence of breeding: bird encountered but no territorial or breeding behavior noted.
1) Possible breeder: a bird encountered singing or acting territorial only once during the breeding season (in suitable habitat).
2) Probable breeder: singing individual encountered on 2 or more different days of point count censuses (at least one week apart); territorial behavior noted more than once at the same location; pair observed in courtship behavior.

3) Confirmed breeder: distraction display; nest building (except woodpeckers and wrens); nesting material or fecal sac being carried by adult; dependent juveniles with adults; active nest observed.

A.O.U. Common Name	Scientific Name	Breeding Status[1]	Nest Type[2]
Acorn Woodpecker	*Melanerpes formicivorous*	2	Cav
American Crow	*Corvus brachyrhynchos*	0	Open
American Robin	*Turdus migratorius*	1	Open
Anna's Hummingbird	*Calypte anna*	3	Open
Ash-throated Flycatcher	*Myiarchus cinerascens*	2	Cav
Barn Swallow	*Hirundo rustica*	0	Open
Bewick's Wren	*Thryomanes bewickii*	2	Cav
Black Phoebe	*Sayornis nigricans*	1	Open
Black-headed Grosbeak	*Pheucticus melanocephalus*	2	Open
Brown Creeper	*Certhia Americana*	3	Cav
Bushtit	*Psaltriparus minimus*	3	Pend
California Towhee	*Pipilo crissalis*	3	Open
Canada Goose	*Branta Canadensis*	0	open
Chestnut-backed Chickadee	*Poecile rufescens*	2	Cav
Cliff Swallow	*Petrochelidon pyrrhonota*	0	Spher
European Starling	*Sturnella vulgaris*	1	Cav
House Finch	*Carpodacus mexicanus*	2	Open
House Wren	*Troglodytes aedon*	3	Cav
Hutton's Vireo	*Vireo huttoni*	2	Cav
Lesser Goldfinch	*Carduelis psaltria*	0	Open
Mourning Dove	*Zenaida macroura*	0	Open

Northern Flicker	*Colaptes auratus*	0	Cav
Northern Harrier	*Circus cyaneus*	0	Open
Nuttall's Woodpecker	*Picoides borealis*	3	Cav
Oak Titmouse	*Baeolophus inornatus*	3	Cav
Dark-eyed Junco	*Junco hyemalis*	3	Open
Pacific-slope Flycatcher	*Empidonax difficilis*	2	Open
Red-shouldered Hawk	*Buteo lineatus*	1	open
Red-tailed Hawk	*Buteo jamaicensis*	2	Open
Spotted Towhee	*Pipilo maculates*	2	Open
Steller's Jay	*Cyanocitta stelleri*	2	Open
Swainson's Thrush	*Catharus ustulatus*	0	Open
Turkey Vulture	*Cathartes aura*	3[3]	Open
Tree Swallow	*Tachycineta bicolor*	0	Cav
Violet-green Swallow	*Tachycineta thalassina*	2	Cav
Warbling Vireo	*Vireo gilvus*	2	Open
Western Bluebird	*Sialia mexicana*	3	Cav
Western Scrub-Jay	*Aphelocoma californica*	2	Open
Western Wood-Pewee	*Contopus sordidulus*	2	Open
White-breasted Nuthatch	*Sitta carolinensis*	3	Cav
Wilson's Warbler	*Wilsonia pusilla*	1	Open

[1]0=no evidence of breeding, 1=possible breeder, 2=probable breeder, 3=confirmed breeder

[2]Open=open cup, Cav=cavity, Sphe=spherical, Pend=pendulum, Dome=dome-shaped

[3] Confirmed as breeder in 2002.

Appendix 3 – EUON

The following bird list includes all birds seen or heard on Eugene O'Neill National Historic Site property during point count surveys, area searches and other visits during the breeding season of 2001 (primarily May and June). This is not a comprehensive list of bird species that may be seen at Eugene O'Neill since we did not survey during migration or during the winter. All species detected during standardized data collection and casual observations are included in the list. Common name (from the 1983 A.O.U. Checklist), breeding status and nest type are listed for all birds encountered.

Breeding status was determined for all species encountered by using information collected during the point count surveys. We used the following four categories as derived from breeding bird atlas criteria (Shuford 1993).

0) No evidence of breeding: bird encountered but no territorial or breeding behavior noted.
1) Possible breeder: a bird encountered singing or acting territorial only once during the breeding season (in suitable habitat).
2) Probable breeder: singing individual encountered on 2 or more different days of point count censuses (at least one week apart); territorial behavior noted more than once at the same location; pair observed in courtship behavior.
3) Confirmed breeder: distraction display; nest building (except woodpeckers and wrens); nesting material or fecal sac being

carried by adult; dependent juveniles with adults; active nest observed.

A.O.U. Common Name	Scientific Name	Breeding Status[1]	Nest Type[2]
Acorn Woodpecker	*Melanerpes formicivorous*	1	Cav
Allen's Hummingbird	*Selasphorus sasin*	1	Open
American Goldfinch	*Carduelis tristas*	0	Open
American Kestrel	*Falco sparverius*	3	Cav
American Robin	*Turdus migratorius*	1	Open
Anna's Hummingbird	*Calypte anna*	2	Open
Bewick's Wren	*Thryomanes bewickii*	2	Cav
Band-tailed Pigeon	*Columbe fasciata*	0	Open
Black Phoebe	*Sayornis nigricans*	2	Open
Black-headed Grosbeak	*Pheucticus melanocephalus*	1	Open
Brown-headed Cowbird	*Molothrus ater*	1	Nest parasite
Bullock's Oriole	*Icterus bullockii*	1	Pend
Bushtit	*Psaltriparus minimus*	1	Pend
California Quail	*Callipepla californica*	1	Ground
California Towhee	*Pipilo crissalis*	0	Open
Chestnut-backed Chickadee	*Poecile rufescens*	0	Cav
Cliff Swallow	*Petrochelidon pyrrhonota*	0	Spher
Downy Woodpecker	*Picoides pubescens*	0	Cav
European Starling	*Sturnella vulgaris*	3	Cav
Hairy Woodpecker	*Picoides villosus*	0	Cav
House Finch	*Carpodacus mexicanus*	2	Open
Hutton's Vireo	*Vireo huttoni*	2	Cav
Lesser Goldfinch	*Carduelis psaltria*	0	Open
Mourning Dove	*Zenaida macroura*	0	Open
Northern Flicker	*Colaptes auratus*	0	Cav
Northern Harrier	*Circus cyaneus*	0	Open
Northern Mockingbird	*Mimus polyglottus*	1	Open

Nuttall's Woodpecker	*Picoides borealis*	0	Cav
Oak Titmouse	*Baeolophus inornatus*	1	Cav
Orange-crowned Warbler	*Vermivora celata*	1	Open
Dark-eyed Junco	*Junco hyemalis*	2	Open
Pacific-slope Flycatcher	*Empidonax difficilis*	1	Open
Red-shouldered Hawk	*Buteo lineatus*	0	open
Red-tailed Hawk	*Buteo jamaicensis*	0	Open
Ruby-crowned Kinglet	*Regulus satrapa*	0	Open
Spotted Towhee	*Pipilo maculates*	2	Open
Steller's Jay	*Cyanocitta stelleri*	1	Open
Swainson's Thrush	*Catharus ustulatus*	0	Open
Townsend's Warbler	*Dendroica townsendi*	0	Open
Tree Swallow	*Tachycineta bicolor*	0	Cav
Turkey Vulture	*Cathartes aura*	0	Open
Violet-green Swallow	*Tachycineta thalassina*	0	Cav
Warbling Vireo	*Vireo gilvus*	2	Open
Western Bluebird	*Sialia mexicana*	3	Cav
Western Scrub-Jay	*Aphelocoma californica*	1	Open
Western Tanager	*Piranga ludoviciana*	0	Open
White-breasted Nuthatch	*Sitta carolinensis*	0	Cav
Wilson's Warbler	*Wilsonia pusilla*	1	Open
White-throated Swift	*Aeronautes saxatalis*	0	Cav
Yellow-rumped Warbler	*Dendroica coronata*	0	Open

[1]0=no evidence of breeding, 1=possible breeder, 2=probable breeder, 3=confirmed breeder

[2]Open=open cup, Cav=cavity/crevice, Sphe=spherical, Pend=pendulum, Dome=dome-shaped,